

REMARKS

Claims 18-20 and 22-37 were pending. Claims 18, 22 and 27 are amended. Claims 1-17, 21 and 38-44 were previously canceled without prejudice or disclaimer of subject matter. Claim 45 is added.

Claims 18-20 and 22-29 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Claims 18-20 and 22-29 were rejected under 35 U.S.C. § 102(b) as being anticipated by Vollmer (US 6,149,051). Claims 18-20 and 22-29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Vollmer (US 6,149,051). Claims 30-37 were allowed.

Claim Amendments

Claim 18 is amended to more clearly define the subject matter of the present invention. More specifically, claim 18 is amended to limit the amount of Zr present, if any, in the braze material to "not more than 12 wt.%". Currently pending claim 20 sets the upper limit of Zr at 12 wt%. One new claim is added, support for which is found in, for example, originally filed claim 28 and several places within the description. No new matter is added.

Allowable Subject Matter

Applicants thank the Examiner for his indication of allowed claims 30-37.

Examiner Interview

Applicants thank the Examiner for his time and willingness to discuss this pending matter. A telephone interview was conducted with the Examiner to discuss the rejection of the claims as made in the outstanding Office Action. Applicants proposed amending the wording of claim 18 as noted above. Applicants submitted to the Examiner that such a limitation would be outside the teachings of Vollmer. Furthermore, Applicants submitted to the Examiner that such a limitation is not new matter, as this limitation was present in the originally filed claims. The claim amendments proposed to the Examiner are those made above. While no specific agreement was reached, the Examiner agreed to consider the proposed amendments in view of the cited references.

Claim Rejections – 35 U.S.C. § 112

Claims 18-20 and 22-29 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. More specifically, the Examiner contends that the previously submitted amendment is new matter, stating that “no support could be found for the upper limit of 12 wt %.” Applicants respectfully submit that the application states the desirability of reducing the Zr content below the conventional 20 to 25wt% and particularly direct the Examiner’s attention to paragraph [017], which states “However, a second heating may be optionally utilized which adds a minimal amount of either Zr or more Ag (PM) in the amount of 1 to 12% by weight to the first braze.” Moreover, originally filed claim 20 states “said braze material is further comprised of a precious metal (PM) and Zr, ... said Zr being 0.5 – 12 wt %.” Clearly, these two previously identified citations show that the upper limit of 12 wt % was in possession of the inventors at the time the application was filed.

For the above reason, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 18-20 and 22-29 as failing to comply with the written description requirement of 35 U.S.C. § 112, first paragraph.

Vollmer (US 6,149,051)

Vollmer discloses a braze material comprising substantially only a Ti-Cu-Ni-Zr mixture. In particular, the braze material may comprise 40Ti-20Cu-20Ni-20Zr.

Claims 18-20 and 22-29 stand rejected under 35 USC 102(b) as being anticipated by Vollmer. Alternatively, Claims 18-20 and 22-20 stand rejected under 35 USC 103(a) as being unpatentable over Vollmer. Claim 18 has been amended to require the amount of Zr present, if any, in the braze material is "not more than 12 wt%". The brazing material of Vollmer contains relative amounts of the constituents at about 25-60 wt. % Ti, 10-25 wt. % Cu, 15-25 wt. % Ni and 15-25 wt. % Zr.

The braze material of the present invention includes Zr in an amount "not more than 12 wt%", as presented in claim 18, as amended, which is at a weight percent less than the range indicated by the teachings of Vollmer (15-25 wt%). Thus, the braze material of Vollmer differs from that used in the present invention, as described in claim 18, as amended.

The Examiner notes that Vollmer discloses that the amounts of Zr present are "about ... 15-25 wt %." It is emphasized that the preferred amount of Zr used by Vollmer is 20% and that he has reasonably added +5% to this for his possible composition range i.e. 15% was intended as an extreme lower limit

by Vollmer. The Examiner contends that Vollmer's range would encompass the claimed upper limit of 12 wt %. Applicants respectfully disagree with the Examiner's conclusion that 12 wt % is encompassed by a teaching of 15-25 wt %. As discussed above, Vollmer teaches away from the lower limit of this range, stating that the preferred braze mixture comprises 20 wt. % Zr. See Vollmer, column 5, lines 39-44. Notwithstanding this observation, Applicants further submit that a teaching of 15 wt % of Zr in a braze material would not motivate someone of ordinary skill in the art to make a braze material containing 12 wt. % (or less) Zr.

The Examiner argues that 15 wt % Zr encompasses the maximum of "not more than 12 wt %" Zr as instantly claimed. This seems to imply that the compositions can be off by plus or minus 1/5 (3/15) of the given compositions. One skilled in the art would clearly understand that such a large variation in the braze composition would lead to significant differences in braze temperatures and poor brazes or ruined parts.

Temperature is critical for brazing. In many braze operations, temperature is kept within +/- 5°C. If this range is breached, the braze may not melt or many properties of the base material may be deteriorated due to, for example, erosion.

If we consider varying the amount of Zr present in a braze composition between the two values (15 wt% and 12 wt%) which the Examiner has concluded would be close enough to be an obvious variation, the following observations may be made. A braze material may be made of a 22Ni 18Cu xZr alloy, wherein Zr may be varied between 15 and 12. In making this Zr variation, the braze temperature of this alloy changes by 12°C. As stated above, if a braze operation temperature range (generally +/- 5°C) is breached, brazability is

affected because such a change in temperature may change the melt properties of the braze and/or may deteriorate the base metal due to, for example, erosion. Therefore, Applicants respectfully submit that "not more than 12 wt%" Zr as instantly claimed is outside the scope of 15-25 wt% Zr as taught by Vollmer.

In addition, the present application contains elements in addition to the Ti, Ni, Cu & Zr disclosed by Vollmer. The additional elements may significantly change the braze chemistry and were not envisioned by Vollmer, e.g. M where M is selected from the group consisting of Fe, V, Cr, Co, Mo, Nb, Mn, Si, Sn, Al, B, Gd, Ge or any combinations thereof. Furthermore, precious metals may be present and a precious metal, copper, nickel ratio, $Ni/(Cu+PM)$, is specified as being between 0.77-0.93. These claim elements, irrespective of zirconia content, are not included in Vollmer's teaching.

For the above reasons, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 18-20 and 22-29 as being anticipated by Vollmer and as being unpatentable over Vollmer.

CONCLUSION

Applicant again would like to thank the Examiner for taking the time to discuss the proposed amendments in a telephone interview. Reconsideration and withdrawal of the Office Action with respect to claims 18-37 are requested. Applicant submits that claims 18-37 and 45 are now in condition for allowance. Early notice to that end is earnestly solicited.

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In the event that the examiner wishes to discuss any aspect of this response, please contact the attorney at the telephone number identified below.

Respectfully submitted,

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